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Remarks

Applicants have amended claim 1 to indicate that:

(i) the fuels are a mixture of hydrocarbons boiling in the gasoline range, described for example in paragraph [0037];

(ii) the first fuel has an aromatic content greater than 45 vol%, described in paragraph [0037]; and

(iii) the second fuel has an aromatic content less than 45 vol%, described in paragraph [0038].

Claim 8 was amended substantially along the lines of claim 1.

Claims 2, 3 and 11 were cancelled.

Claims 4 and 12 were amended to depend from claim 1.

Claims 13 to 47 were cancelled; however, applicants preserve their right to file divisional applications directed toward those claims.

Claim 47 was added, support for which can be found in paragraph [0038].

The Examiner has rejected claims 1 to 12 under 35 USC 103(a) based on either Ma or IiYama in view of Weissman. Applicants respectfully request the Examiner to reconsider and withdraw that rejection.

Ma and IiYama disclose systems for separating a fuel into a high octane fuel and a low octane fuel; however there is no disclosure in these references of a

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plurality of fuels defined by boiling range, RON, burn rate, laminar flame speed, aromatic content and operability, i.e., without knocking, under specified engine load conditions in an engine having a CR of 11 or more. Moreover, the secondary reference, Weissman, fails to overcome these deficiencies.

Weissman is concerned with a single fuel and not a plurality of fuels. Weissman's single fuel includes a high laminar flame speed species and has specified volatility characteristics that render it useful in lean burn engines operating under low load but which meet the octane requirements when the engine is operating at high load. (See the paragraph bridging pages 1 and 2.) Since Weissman teaches use of a single fuel to meet high and low load conditions there is absolutely no motivation to consider using a Weissman fuel in Ma or liYama. Also, of the 4 fuels (See B to E in Table 2) which Weissman teaches significantly extend the lean limit, 3 have RON's greater than 90. Even the reference fuel in Weissman has a RON greater than 90. Applicants teach using a fuel having a RON less than 90 under low load conditions which clearly teaches away from Weissman's preferred composition for low load.

The key to Weissman is the discovery that a fuel having specific distillation characteristics and flame speed permits operation of lean burn engines at lower lean burn limits.

Applicants have discovered a plurality of fuel compositions that are not defined by the Weissman distillation characteristics but instead are defined by operability in an engine having a CR greater than 11, by RON, flame speed, burn rate and aromatics content. Applicants' first fuel has a RON greater than 100 and greater than 45 vol% aromatics. Only fuel D of Weissman has a RON greater than 100, viz. 100.5, but it has less than 45 vol% aromatics.

Applicants' second fuel is a low octane, high flame speed fuel with autoignition tendency that is capable of reducing emissions and increasing efficiency

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under low load conditions and high CRs. Weissman fails to make any such suggestion or disclosure.

Regarding the Examiner's assertion that it would be obvious to modify the aromatics content of Weissman's fuel, applicants submit, first, that the Examiner has failed to provide any motivation to do so, and secondly, such modification could possibly alter the required distillation characteristics of the fuel which is crucial in Weissman.

In view of the foregoing, applicants respectfully submit that their claimed invention is patentable over the cited art and request an early allowance.

Respectfully submitted,



Paul E. Purwin  
Attorney for Applicant(s)  
Registration No. 29,203  
Telephone Number: (908) 730-3618  
Facsimile Number: (908) 730-3649

☐ Pursuant to 37 CFR 1.34(a)

ExxonMobil Research and Engineering Company  
P. O. Box 900  
Annandale, New Jersey 08801-0900

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